

APPLICATION FOR UNITED STATES LETTERS PATENT

by

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for a

**DEVICE AND METHOD FOR AUGMENTING CELLULAR TELEPHONE
AUDIO SIGNALS**

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DEVICE AND METHOD FOR AUGMENTING CELLULAR TELEPHONE AUDIO SIGNALS

BACKGROUND

Field of the Invention

[0001] The present invention relates generally to battery technology used in cellular telephones. More specifically, the present invention is directed to a device and method for augmenting the choice of available cellular telephone audio signals through a programmable battery.

Background of the Invention

[0002] Cellular telephones, also commonly known as mobile telephones, have become increasingly utilized throughout the world. Typical signals used to alert a user of a cellular telephone of an incoming telephone call include audio signals such as ringing, visual signals such as light flashes or written messages, or touch signals such as vibration of the telephone. A combination of signals also is possible, such as, for example, a combination of audio and visual signals.

[0003] When a cellular telephone provides audio signals, the user typically has a limited number of pre-selected audio signal selections (which may include standard rings, musical tones, or melodies) already programmed into the telephone. Many conventional telephones do not have the ability to introduce additional audio alert signals. Thus, the user is confined to a limited group of audio alert signals that a manufacturer has pre-programmed into the telephone. Although some telephone systems allow a user to download additional audio alert signals into the telephone, such additional signals typically are provided only by the manufacturer, and are

merely an expansion of the original limited inventory of audio signals available to a user. Thus, the user is still confined to a set of audio signals that a manufacturer provides to its users. The user does not have the ability to use audio signals of her own choice, such as, for example, a favorite song or melody, sounds of nature, or voice sounds of a child or a pet or the voice of the user herself.

[0004] Thus, there is a need for an economical but flexible device and method that enables a user to easily program any type of audio sounds into a cellular telephone and allow such audio sounds to be designated as the incoming telephone call audio alert signal.

SUMMARY OF THE INVENTION

[0005] The present invention overcomes the drawbacks of conventional cellular telephone audio alert signals by providing a device and method that enables the user to enter audio signals of his or her own choice to use as audio alert signals for the telephone.

[0006] As used throughout this disclosure, the term “augmenting”, when used in reference with cellular telephone audio signals, refers to an increase in choices that a user has for audio alert signals. Thus, an increase in choices of alert signals beyond that provided by a manufacturer is an augmenting of cellular telephone audio signals.

[0007] As used throughout this disclosure, the term “sound generating device” is any assembly that is capable of storing sound files, retrieving sound files, and playing sound files. Thus, such a device typically is piezoelectric and contains software to enable a stored sound file to be played, necessary EPROM, ROM and/or RAM memories, and a small speaker. Such sound generating devices typically are used in

toys and musical cards. This sound generating device 110 will be explained in use below.

[0008] In accordance with an exemplary embodiment, the present invention provides a battery assembly for a cellular telephone that plays sounds. The battery assembly includes a battery, for providing power for a cellular telephone, and a sound generating device attached to the battery and capable of storing a sound file. Thus, the sound generating device is triggered to play sound when a telephone call is received. A user then can choose the type of sound she wishes to alert her of an incoming telephone call, and have the chosen telephone sound alert her of an incoming call.

[0009] In accordance with another exemplary embodiment, the present invention provides a battery assembly for a cellular telephone that includes a battery, for providing power to the cellular telephone, and a sound generating device attached to the battery and including a memory for storing multiple sound files. The sound generating device can be induced to play one of the multiple sound files when a telephone call is received. The battery assembly also includes an external connector socket that provides external electrical access the multiple sound files inside the sound generating device, and a selector device for designating a particular sound file to be the one used as audio alert signal.

[0010] In accordance with another exemplary embodiment, the present invention provides a cellular telephone system having changeable audio alert signals. The system includes a cellular telephone body and a cellular telephone battery. The battery further includes a sound generating device having a memory to store a sound

file. The sound generating device can be induced to play a sound file when a telephone call is detected by the cellular telephone. Alternatively, the sound generating device can store multiple sound files. Furthermore, the cellular telephone assembly also may include an external socket to provide external access to the multiple sound files saved in the sound generating device. Optionally, a computer system may be linked to the external socket to edit the multiple sound files stored in the sound generating device. Finally, a selector may allow a user to choose a particular sound file from the multiple sound files to be designated as the audio alert signal.

[0011] In yet another exemplary embodiment, the present invention provides a method of selecting a designated audio alert signal on a cellular telephone. This method involves providing a programmable battery for a cellular telephone that has a sound generating device storing multiple sound files and a selector for choosing a file among the sound files. The user can scroll through the sound files by using the selector until a desired sound file is heard. The user then stops scrolling through the sound file, and the chosen sound file is then used as the audio alert signal when incoming calls are received.

[0012] In accordance with an exemplary embodiment, the present invention provides a device and method for selectively programming a telephone with any type of sound signal to be used as an audio alert signal for incoming calls.

[0013] In another exemplary embodiment, the present invention provides a device and method that is compatible with any type of cellular telephone system.

[0014] It is therefore an object of the present invention to provide a device and method of augmenting cellular telephone audio alert signals that do not require changing the design of the telephone body itself.

[0015] These and other objects of the present invention will become apparent upon a reading of the following detailed description in conjunction with the associated drawings.

[0016] It is to be understood that both the foregoing general description and the following detailed description are exemplary and explanatory only and are not restrictive of the invention, as claimed.

[0017] The advantages and purpose of the invention will be set forth in part in the description that follows, and in part will be obvious from the description, or may be learned by practice of the invention. The advantages and purpose of the invention will be realized and attained by means of the elements and combinations particularly pointed out in the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] Fig. 1 illustrates a conventional cellular telephone body with a device, according to an exemplary embodiment of the present invention, that allows for a variety of audio alert signals to be used.

[0019] Fig. 2 illustrates an exemplary embodiment of a system and method of programming audio alert signals into a device according to the exemplary embodiment shown in Fig. 1.

DETAILED DESCRIPTION OF THE INVENTION

[0020] An exemplary embodiment of a device according to the present invention is shown in Fig. 1. The overall cellular telephone system 100 includes a conventional cellular telephone body 101 and an exemplary embodiment of a device 102 according to the present invention. The device 102 is in the form of a battery that produces sound, thereby making such a system and method of augmenting the choice of available telephone audio signals both economical and flexible.

[0021] The exemplary embodiment of the present invention shown in Fig. 1 presents an improvement based on the technology of vibrating batteries, wherein an activation signal is directed to the vibrating battery to vibrate the telephone when an incoming call is received. Thus, operation of battery 102 according to the embodiment shown in Fig. 1 also requires an incoming signal from the body of the telephone 101 to signal the battery 102 to produce an audio signal. The telephone body 101 does not have to be modified to accommodate the new sound-producing battery 102. Furthermore, the telephone 101 is merely set up as if the sound-producing battery 102 is a vibrating battery, thereby enabling the telephone body 101 to send a signal to the battery 102 when an incoming telephone call is received.

[0022] The telephone body 101 is in communication with the battery 102 through, for example, suitable terminal connectors 103 and 104, respectively. Thus, when an incoming telephone call signal is detected by the cellular telephone system 100, the telephone body 101 sends a signal to the battery 102 to activate. When the sound-producing battery 102 is taking the place of a conventional vibration battery, a sound generating device 110 incorporated in battery 102 is signaled to activate, producing a

given audio alert signal. In all aspects, the telephone body 101 is conventional and only needs to notify battery 102 that an incoming telephone signal is received.

Furthermore, the designated audio alert signal also may be used for other notification alarms that are available on the cellular telephone, such as appointment alarms and the like.

[0023] Sound generating device 110 may comprise, for example, a piezoelectric device for converting electronic signals to sound waves. Alternatively, it may also comprise a miniature speaker or other transducer for converting electronic signals to sound waves. The sound generating device also has a memory in which the sound files can be stored. A sound chip that has all the components necessary to store, access, play, and generate sound from sound files may be used.

[0024] Battery 102 has terminal connectors 104 that communicate with sound generating device 110 through suitable electrical connectors 105. Terminal connectors 104 are also used to supply power through terminal connectors 103 to the telephone body 101. The power storage area of the battery 102 is not shown for sake of clarity. However, the power storage area of the battery 102 is also in communication with the terminal connectors 104 through suitable electrical connectors.

[0025] Sound generating device 110 may be pre-programmed with a set of audio signals that a user may use as the audio alert signal when an incoming telephone call is received. Thus, a user may purchase a battery 102 that has a list of audio alert signals pre-programmed into it. As a non-limiting example, different batteries 102 may have different themes, such as “sounds of nature”, “popular songs”, and

“different automobile honks”. When a user prefers another set of audio alert signals, she merely has to purchase another battery that provides such signals.

[0026] When a battery 102 provides a user with a list of accessible audio alert signals, the user needs a means to select a particular desired audio signal. Such a selector means to select a desired audio alert signal may be, for example, a selector switch, button, mechanical selector, touch pad, or the like. In the embodiment shown in Fig. 1, a selector switch 130 is shown that enables a user to select a desired audio alert signal by pushing up or down on selector arrows that scroll through an internal library of signals stored in sound generating device 110. In the exemplary embodiment shown in Figure 1, pressing the up or down arrows allows the user to scroll through the selection of stored audio signals. Optionally, the user is able to hear the selections as the selections are being scrolled, so as to have an indication of which signal the battery 102 is being locked into using as the pre-selected audio alert signal.

[0027] Alternatively, to expand the selections of audio alert signals even beyond that provided by batteries 102 having different themes, an accessing means would be beneficial to provide a user with ability to access and edit the audio signal library of the battery. Thus, such a means for accessing the signal library of the battery may be, for example, an electrical connector socket, plug, adapter, or the like. In the exemplary embodiment shown in Fig. 1, an electrical connector socket 120, which is electrically connected to the sound generating device 110 through suitable electrical connectors 121, is designed to receive a conventional two prong plug 220, such as the one shown in Fig. 2.

[0028] Although the switch 130 and the connector socket 120 are shown on a side of the battery 102 for sake of accessibility and ease of operation for a user, such placement is merely exemplary. The switch 130 and socket 120 may be placed anywhere on the battery 102 as long as they may be accessed by a user and are usable for their intended purposes.

[0029] Optionally, sound generating device 110 may be programmed with more than one audio signal. A means for programming the audio signal selection of a battery 102 is shown in the exemplary embodiment in Fig. 2 as system 200. System 200 includes a plug 220 that electrically communicates with the socket 120, and allows a computer 201 to program sound generating device 110 (not shown in Fig. 2). Computer 201 may be provided with software that allows a user to access, edit and provide input to the audio alert signal library in sound generating device 110. The computer 201 may be a desktop model with a monitor 202 and a keyboard 203, a laptop, a personal data assistant, or any other device that has the ability to electronically access a library or stored audio files in a sound generating device 110.

[0030] Through the programming system 200, the user may add or delete sound files from the sound generating device 110. The sound files may be in any suitable format, such as, for example, MP3. A software package, provided with the audio programmable battery 102, would allow a user to arrange the order of sound signals in a given battery 102, delete any sounds signals that are no longer desired, or to add new sound signals in a given memory slot in the sound generating device 110.

[0031] Although the programming system 200 in Fig. 2 has been shown with a personal computer 201, other computers are also possible to program the alert signal

library in the sound generating device 110. Such other computers include, but are not limited to, laptop computers, personal data assistants, suitable interactive paging systems, or the like. A telephone body 101 itself may be additionally programmed by its manufacturer to be able to scroll through, access, and edit alert signals in the signal library of a sound generating device 110 in a battery 102.

[0032] The foregoing disclosure of the preferred embodiments of the present invention has been presented for purposes of illustration and description. It is not intended to be exhaustive or to limit the invention to the precise forms disclosed. Many variations and modifications of the embodiments described herein will be obvious to one of ordinary skill in the art in light of the above disclosure. The scope of the invention is to be defined only by the claims appended hereto, and by their equivalents.

[0033] Further, in describing representative embodiments of the present invention, the specification may have presented the method and/or process of the present invention as a particular sequence of steps. However, to the extent that the method or process does not rely on the particular order of steps set forth herein, the method or process should not be limited to the particular sequence of steps described. As one of ordinary skill in the art would appreciate, other sequences of steps may be possible. Therefore, the particular order of the steps set forth in the specification should not be construed as limitations on the claims. In addition, the claims directed to the method and/or process of the present invention should not be limited to the performance of their steps in the order written, and one skilled in the art can readily appreciate that

the sequences may be varied and still remain within the spirit and scope of the present invention.